

## Western Bridge Engineer's Seminar

Peppermill Hotel – Reno, Nevada

September 9-11, 2015

**Title:**            *Where's the Guidance?*  
*An Interim Approach for Load Rating Culverts and Flexible Buried Bridges*  
September 10, 10:30 a.m. to Noon

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### **Abstract:**

Much effort has been focused on load rating of bridges for vehicular loads, while (until recently) load rating for the nation's culvert and flexible buried bridge inventory has had relatively little rating attention. *This easily involves hundreds of thousands of structures nationwide.* Most bridge load rating is focused on the gross truck weight and known loads and structure properties, while the response of typical culverts and flexible buried bridges is usually driven by the response to a single axle and often a single wheel and can depend on unknown factors. The AASHTO LRFD Manual for Bridge Evaluation (MBE) provides a lot of useful tools and procedures for load rating existing bridges for current design requirements. However, the MBE does not address load rating for culverts or flexible buried bridges, and many states don't have budgets to dedicate people to evaluating and rating buried structures. There is an NCHRP study getting ready to start to address rating these types of structures, but the question remains: "What do I do until then?"

There have been resources and/or tools developed by some consultants, states and industry organizations to perform load ratings for these types of structures. However, the approaches vary and in general, have attempted to apply calculations and principles that were developed for traditional bridges – much of which is not applicable for buried structures. Calculations are often complicated and difficult to follow and result in rating factors that don't pass the "smell test." Most of these methods also do not consider soil-structure interaction and structure geometry, which are critical factors in supporting design loads. To date, there has been no consensus regarding which (if any) of these are correct, and none of them have been incorporated into the MBE.

With the lack of consensus on which approach to take, the best course might be to keep it simple. The goal of this presentation is to suggest a simplified common sense interim approach for load rating culverts and flexible buried bridges. This approach will focus on proper evaluation of the condition of the structure and site conditions, a realistic approach to design

loads, options to improve load rating, and guidelines for evaluating results. Among the specific topics to be discussed are design, materials, foundations, load rating, construction, maintenance, and engineering judgment.